Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in this application:

Listing of Claims:

1. (Currently amended) A data reading device, comprising:

a magnetic tunneling junction comprising layers of magnetic material selected from the group consisting of ferromagnetic material and ferrimagnetic material, wherein at least some of the layers of magnetic material are separated by at least one insulating layer;

a magnetic medium comprising [[a]] at least one domain having [[respective]] domain walls;

wherein an electric current is passed through the magnetic medium to selectively shift the domain walls in a direction of the electric current; and

wherein data stored in the domain is selectively read by disposing the magnetic tunneling junction in proximity to a fringing magnetic field from one of the domain walls, and by using the fringing magnetic field to detect a magnetic moment of the domain.

2. (Original) The data reading device of claim 1, wherein the magnetic medium comprises a magnetic track.

3. (Original) The data reading device of claim 1, wherein the data is read by shifting the one of the domain walls in the magnetic medium.

4. (Original) The data reading device of claim 1, wherein one of the layers of the magnetic material is pinned.

5. (Original) The data reading device of claim 4, wherein the pinned layer of magnetic material is comprised of a magnetic material that is magnetically hard in the presence of the domain wall fringing magnetic field.

6. (Original) The data reading device of claim 4, wherein one of the layers of magnetic material is free.

7. (Original) The data reading device of claim 6, wherein the free layer of magnetic material is comprised of a magnetic material that is magnetically soft in the presence of the domain wall fringing magnetic field.

8. (Original) The data reading device of claim 6, wherein the data reading device comprises a first state and a second state.

9. (Original) The data reading device of claim 8, wherein in the first state, a magnetic moment of the free layer of magnetic material is parallel to a magnetic moment of the pinned ferromagnetic layer.

10. (Original) The data reading device of claim 8, wherein in the second state, a magnetic moment of the free layer of magnetic material is anti-parallel to a magnetic moment of the pinned layer of magnetic material.

11. (Original) The data reading device of claim 6, wherein an electrical resistance of the data reading device determines a relative orientation of the free layer of magnetic material and the pinned layer of magnetic material.

12. (Original) The data reading device of claim 11, wherein a first electrical resistance value of the data reading device represents a "1" bit data.

13. (Original) The data reading device of claim 11, wherein a second electrical resistance value of the data reading device represents a "0" bit data.

14. (Original) The data reading device of claim 11, wherein the electrical resistance value of the data reading device is determined by applying an electrical current to the data reading device.

15. (Original) The data reading device of claim 1, wherein the magnetic medium comprises a shift register.

16. (Original) The data reading device of claim 15, wherein the shift register comprises a plurality of magnetic domains for storing the data.

17. (Original) The data reading device of claim 16, wherein the data is read by shifting domain walls in the shift register.

18. (Original) The data reading device of claim 1, wherein the magnetic medium comprises a data storage disk.

19. (Original) The data reading device of claim 1, wherein the data is read by shifting the domain wall in the magnetic medium in a first direction.

20. (Original) The data reading device of claim 19, wherein the data is read by shifting the domain wall in the magnetic medium in a second direction.

21. (Currently amended) A method of making a data reading device, comprising:

forming a magnetic tunneling junction by providing layers of magnetic material selected from the group consisting of ferromagnetic material and ferrimagnetic material;

separating at least some of the layers of the magnetic material by at least one insulating layer;

forming a magnetic medium comprising [[a]] at least one domain having [[respective]] domain walls;

wherein an electric current passing through the magnetic medium selectively shifts the domain walls in a direction of the electric current; and

wherein data stored in the domain is selectively read by disposing the magnetic tunneling junction in proximity to a fringing magnetic field from one of the domain walls, and by using the fringing magnetic field to detect a magnetic moment of the domain.

22. (Original) The method of claim 21, wherein the magnetic medium comprises a magnetic track.

23. (Original) The method of claim 21, wherein reading the data comprises shifting the one of the domain walls in the magnetic medium.

24. (Original) The method of claim 21, wherein one of the layers of magnetic material is pinned.

25. (Original) The method of claim 24, wherein the pinned layer of magnetic material is comprised of a magnetic material that is magnetically hard in the presence of the domain wall fringing magnetic field.

26. (Original) The method of claim 24, wherein one of the layers of magnetic material is free.

27. (Original) The method of claim 26, wherein the free layer of magnetic material is comprised of a magnetic material that is magnetically soft in the presence of the domain wall fringing magnetic field.

28. (Original) The method of claim 26, wherein the data reading device comprises a first state and a second state.

29. (Original) The method of claim 28, wherein in the first state, a magnetic moment of the free layer of magnetic material is parallel to a magnetic moment of the pinned ferromagnetic layer.

30. (Original) The method of claim 28, wherein in the second state, a magnetic moment of the free layer of magnetic material is anti-parallel to a magnetic moment of the pinned layer of magnetic material.

31. (Original) The method of claim 26, wherein an electrical resistance of the data reading device determines a relative orientation of the free layer of magnetic material and the pinned layer of magnetic material.

32. (Original) The method of claim 31, wherein a first electrical resistance value of the data reading device represents a "1" bit data.

33. (Original) The method of claim 31, wherein a second electrical resistance value of the data reading device represents a "0" bit data.

34. (Original) The method of claim 31, wherein the electrical resistance value of the data reading device is determined by applying an electrical current to the data reading device.

35. (Original) The method of claim 21, wherein the magnetic medium comprises a shift register.

36. (Original) The method of claim 35, wherein the shift register comprises a plurality of magnetic domains for storing the data.

37. (Original) The method of claim 36, wherein the data is read by shifting domain walls in the shift register.

38. (Original) The method of claim 21, wherein the magnetic medium comprises a data storage disk.

39. (Original) The method of claim 21, wherein the data is read by shifting the domain wall in the magnetic medium in a first direction.

40. (Original) The method of claim 39, wherein the data is read by shifting the domain wall in the magnetic medium in a second direction.

41. (Currently amended) A method of reading data stored on a data storage device that comprises a magnetic tunneling junction formed of layers of magnetic material selected from a group consisting of ferromagnetic material and ferrimagnetic material, wherein the layers of magnetic material are separated by [[an]] at least one insulating layer; and a magnetic medium comprising [[a]] <u>at least one</u> domain having respective domain walls, the method comprising:

selectively reading data stored in the domain by disposing the magnetic tunneling junction in proximity to a fringing magnetic field from one of the domain walls [[, and by]]

<u>passing an electric current through the magnetic medium to selectively shift the domain walls in a direction of the electric current; and</u>

using the fringing magnetic field to detect a magnetic moment of the domain.

42. (Original) The method of claim 41, wherein the magnetic medium comprises a magnetic track.

43. (Original) The method of claim 41, wherein reading the data comprises shifting the one of the domain walls in the magnetic medium.

44. (Original) The method of claim 41, wherein one of the layers of magnetic material is pinned.

45. (Original) The method of claim 44, wherein the pinned layer of magnetic material is comprised of a magnetic material that is magnetically hard in the presence of the domain wall fringing magnetic field.

46. (Original) The method of claim 44, wherein one of the layers of magnetic material is free.

47. (Original) The method of claim 46, wherein the free layer of magnetic material is comprised of a magnetic material that is magnetically soft in the presence of the domain wall fringing magnetic field.

48. (Original) The method of claim 46, wherein the data reading device comprises a first state and a second state.

49. (Original) The method of claim 48, wherein in the first state, a magnetic moment of the free layer of magnetic material is parallel to a magnetic moment of the pinned ferromagnetic layer.

50. (Original) The method of claim 48, wherein in the second state, a magnetic moment of the free layer of magnetic material is anti-parallel to a magnetic moment of the pinned layer of magnetic material.

51. (Original) The method of claim 41, wherein the magnetic medium comprises a plurality of magnetic domains for storing the data.

52. (Original) The method of claim 51, further comprising shifting the plurality of magnetic domains.